

State of Washington

**Volunteer Firefighters' Relief
and Pension Fund
Actuarial Valuation**

As of December 31, 2001



WASHINGTON STATE LEGISLATURE
Office of the State Actuary

**Report of the Actuarial Valuation of the
Volunteer Firefighters' Relief and Pension Fund
As of December 31, 2001**

This report represents the results of the actuarial valuation of the assets and liabilities of the Volunteer Firefighters' Relief and Pension Fund of Washington as of December 31, 2001. The valuation was prepared in accordance with RCW 41.24.320.

Member and beneficiary data was provided by the Board of Volunteer Firefighters. Comparisons were made of the current to prior year's data. Additionally, a series of data edits were performed. The data is sufficient and reliable for the purposes of this valuation. Unaudited asset information was provided by the State Investment Board and the State Treasurer.

The investment return assumption used in this valuation were set by law in 2001.

Demographic assumptions were developed by the Office of the State Actuary. The assumptions are developed from actual experience. An experience study of retirement and termination is performed annually. Where there is insufficient data for an experience study, we use our best estimate of the assumption. The assumptions are reasonable and represent the expected future experience.

The valuation includes all benefits that were in effect as of December 31, 2001.

This report was prepared in accordance with recognized actuarial practices and the procedures consistent with the recommendations of the American Academy of Actuaries.

Respectfully submitted,

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Section I

Summary & Highlights

Summary & Highlights

The purpose of an actuarial valuation is to:

- ✓ Develop *contribution rates* which are adequate to support the benefits of the system, as prescribed in statute;
- ✓ Measure the *funding progress* of the system;
- ✓ Compare experience with assumptions used;
- ✓ Detect significant demographic changes;
- ✓ Highlight significant plan changes; and
- ✓ Highlight significant assumption changes.

Contributions:

	<u>2000 Valuation</u>	<u>2001 Valuation</u>
Pension		
Employee	\$ 30	\$ 30
Employer	\$ 30	\$ 30
State	<u>\$ (182)</u>	<u>\$ (197)</u>
	\$(122)	\$(137)
Relief (Disability, Survivor, and Medical Benefits)		
Employer	\$ 10	\$ 10
State	\$ 70	\$ 80
Administration	\$ 10	\$ 15*
*The \$15 administration rate is based on actual costs in 2001. If we used the allocation to the Administration Fund, the rate would have been \$3.		

The contribution rates developed in this report have decreased for pension benefits and increased for relief benefits.

The Relief and Administration costs are for all volunteer fire fighters. The Pension costs are only for those enrolled in the pension system.

Measurement of Funding Progress:

We have used the *Funding Ratio* as a measure of funding progress. The *Funding Ratio* is the percentage of benefits earned to date which are covered by valuation assets.

Funding Progress	
Year	Funding Ratio
12/31/01*	142%
12/31/00*	144%

*Assumptions changed.

Comparison of Assumption to Experience:

- ✓ *Investment Return* on Valuation Assets was 4.3%, versus a 8.0% assumption. Return on Market Value Assets was -5.5%.
- ✓ *Retirements* were 27% below expected.
- ✓ *Terminations* were 46% above expected.

Significant Demographic Changes:

- ✓ The number of *active members* covered by the pension plan decreased by 258 (-2.1%).
- ✓ The number of *active members* covered by the relief plan increased by 187 (+1.1%).
- ✓ Total number of retirees increased by 105 (+4.0%).
- ✓ Total annual pension *benefits* increased by \$171,439 (+3.2%), from \$5,276,500 to \$5,447,939.
- ✓ Average *monthly benefit* for all annuitants decreased by \$1 (-0.6%) from \$167 to \$166.

Distribution of Membership Between 2000 and 2001		
	2000	2001
Number of Active Members in Pension Plan*	12,254	11,996
Number of Active Members in Relief Plan	17,607	17,794
Number of Active Members in either Plan	17,612	17,794
Percent of Volunteers Covered by Pension Plan	70%	67%
Average Age	40.8	40.9
Average Years of Service	10.1	10.1
Number of Retirees	2,638	2,743
Number of Terminated Vested	3,960	4,210
Number of Survivors (Line of Duty)	13	14
Number of Disabilities	12	14

*Includes 27 Emergency Medical Technicians and 219 Reserve Law Enforcement Officers in 2001.

Significant Plan Changes

There were no plan changes in 2002.

Significant Assumption Changes

The demographic experience of this plan was reviewed as we do every six years for all the plans we value. As a result, the termination rate was increased. The mortality assumption was changed to be consistent with the change made for PERS. The retirement assumptions were changed slightly as well. The new assumptions are disclosed in Appendix A.

The effect of these changes on the pension costs are shown below:

	Assumption	
<u>Total Pension Cost</u>	Prior	Updated
Normal Cost	\$ 1,526,000	\$ 1,426,000
Amortization of Actuarial Surplus	<u>\$ (3,156,000)</u>	<u>\$ (3,067,000)</u>
Total Pension Cost	\$ (1,631,000)	\$ 1,641,000
<u>Per Person Cost</u>		
Normal Cost	\$ 127.17	\$ 118.85
Amortization of Actuarial Surplus	<u>\$ (263.12)</u>	<u>\$ (255.66)</u>
Per Person Cost	\$ (135.95)	\$ (136.81)

Section II

Analysis of the Valuation

Analysis of the Valuation

- ✓ Funding Progress
- ✓ Contribution Levels
- ✓ Economic Assumptions
- ✓ Demographic Changes in Membership

Funding Progress

Funding Ratio:

There are various ways of measuring funding progress or funding status. We use a measure of funding status called the Funding Ratio. A Funding Ratio is the ratio of assets to liabilities on the valuation date.

Funding Ratios, when developed on a comparable basis, serve two important functions. They promote comparison between retirement systems and, in time sequence, are valuable as a trend indicator of funding progress or lack thereof.

At present the Volunteer Firefighters' Relief and Pension Fund is well funded. The funding ratio is 142%. The Funding Ratio itself has no part in the calculation of the required contribution. It is strictly an independent measuring device to promote analysis of funding progress and comparison to other retirement systems.

Calculation of Funding Ratios:

The Funding Ratio is calculated as the ratio of *asset value* to the *actuarial present value of credited projected benefits* as of the valuation date. The methods used to determine these items are as follows:

- ✓ *Asset Value* - For this purpose, asset values used are the Valuation Assets described in Appendix A and developed in Section IV.
- ✓ *Actuarial Present Value of Credited Projected Benefits* - Benefits are projected to retirement, including future service, but prorated by only that service earned to date.

COMPONENTS OF THE ACTUARIAL PRESENT VALUE OF CREDITED PROJECTED BENEFITS AND THE PERCENTAGE OF EACH COVERED BY ASSETS

	LIABILITIES*** (000)			Valuation Assets	Portion of Liability Covered by Assets			Funding Ratio
	Employee	Retiree	Employer		(1)	(2)	(3)	
	(1)	(2)	(3)					
2001*	\$4,668	\$60,451	\$25,858	\$128,799	100%	100%	246%	142%
2000*	4,658	57,122	25,933	126,332	100%	100%	249%	144%
1999	4,616	55,998	28,260	117,622	100%	100%	202%	132%
1998**	4,158	52,940	28,084	102,434	100%	100%	161%	120%
1997	4,055	39,439	19,750	90,835	100%	100%	240%	144%
1996	3,092	37,398	20,365	78,165	100%	100%	185%	129%
1995*	3,063	35,493	19,980	69,065	100%	100%	153%	118%
1994	3,029	32,723	19,071	61,576	100%	100%	135%	112%
1993*	3,029	30,542	21,099	59,360	100%	100%	121%	114%
1992	2,068	28,431	19,848	54,285	100%	100%	120%	108%
1991**	1,882	26,477	19,367	49,114	100%	100%	107%	103%
1990	1,830	21,734	16,940	45,102	100%	100%	127%	111%
1989*	1,800	20,448	16,217	43,104	100%	100%	129%	112%
1988	1,700	20,374	17,856	38,504	100%	100%	92%	96%

*Actuarial assumptions changed.

**Includes the effect of benefit increases.

*** (1) Active employee accumulated contributions.

(2) Retired (and terminated vested) liability - employee and employer financed.

(3) Employer financed portion of active liability.

Funding Progress:

Section III of this report examines the development of the Funding Ratio for 2001. The Actuarial Present Value of Credited Projected Benefits (the cost of that portion of a projected pension attributed to service to date) is \$90,977,000. If the level of the Funding Ratio were about 100%, we would have approximately that amount of money in our investment fund to cover these benefits. But assets exceeded that level. As of December 31, 2001, valuation assets were \$128,799,000. The ratio of the two, or the Funding Ratio, is 142%. The difference, or *Unfunded Actuarial Present Value of Credited Projected Benefits*, is a surplus of \$37,822,000.

Contribution Levels

The method used to determine the contribution as a level dollar amount (Entry Age Cost Method -- see Appendix B) divides the contribution into two parts: Normal Cost and Unfunded Actuarial Accrued Liability Cost. The sum of these two should satisfy all of the liabilities of the system if: the contributions are made regularly; benefits are not increased; and assumptions prove reasonable. Because one source of revenue is erratic (the premium tax on fire insurance policies), it is unlikely that we will see a smooth pattern of contributions.

The contributions developed in this valuation are:

Normal Cost	2000 Valuation	2001 Valuation
Employee	\$ 30.00	\$ 30.00
Employer	30.00	30.00
State	66.78	58.85
Total	\$ 126.78	\$ 118.85
Unfunded Actuarial Accrued Liability		
State	\$ (249.22)	\$ (255.66)
Grand Total	\$ (122.44)	\$ (136.81)

Economic Assumptions

Economic assumptions are not as readily analyzed by statistical methods as are demographic assumptions. These assumptions (investment return rates and general salary increases) depend for validity upon the status of the economy and upon the relationships of these items to inflation.

- ✓ *Investment Returns* - The actual dollar-weighted rate of return for the year was 4.3% based on the Valuation Assets. We had assumed a rate of 8.0% for this period. The return based on Market Value, as reported by the State Investment Board, was -5.5%. The investment return assumption is chosen to develop the overall, long-term effect of the economy on our retirement systems. Significant variations of investment earnings from those assumed should be expected over a short period. The funding of pensions is a long-term proposition and deviations from assumptions over a short time do not necessarily affect long-term costs. Future investment return is assumed to be 8% per year.
- ✓ *Premium Tax* - 40% of the premium tax paid on fire insurance policies is contributed to the plan. The level has fluctuated because the amount of the contribution is net of amounts paid by insurers to guarantee associations. The 1993 Legislature repealed the offset of insurance companies' contribution to guarantee associations. Some insurance companies pay their assessments in five annual installments. Because of this lag in payments, the "Net Premiums" will approach but may not exactly equal the "Gross Premiums" for a few more years.

Premium Tax			
Fiscal Year	Gross Premium Tax	Assessment Credits	Net Premium Tax
2001	\$ 3,320,026	\$ 291	\$ 3,319,735
2000	\$ 2,869,387	\$ 393	\$ 2,868,994
1999	\$ 2,705,585	\$ 29	\$ 2,705,556
1998	\$ 2,286,092	\$ 756	\$ 2,285,336
1997	\$ 2,553,181	\$ 14,080	\$ 2,539,101
1996	\$ 2,991,158	\$ 18,166	\$ 2,972,992
1995	\$ 2,379,854	\$ 50,074	\$ 2,329,780
1994	\$ 2,460,676	\$ 91,147	\$ 2,369,529
1993	\$ 2,131,915	\$ 115,837	\$ 2,016,078
1992	\$ 1,852,699	\$ 116,711	\$ 1,735,988
1991	\$ 2,246,233	\$ 165,584	\$ 2,080,649
1990	\$ 2,040,938	\$ 149,266	\$ 1,891,672
1989	\$ 2,026,826	\$ 126,878	\$ 1,899,948

**Gross Premium Tax - Assessment Credits = Net Premium Tax*

We are assuming the premium tax will remain level over the next few years.

Demographic Changes in Membership

One major factor in any analysis of valuation results is the extent to which the size and composition of the group of covered employees has changed. A comparison of significant characteristics of the covered group as of December 31, 2001 to that as of December 31, 2000 follows:

Actives:

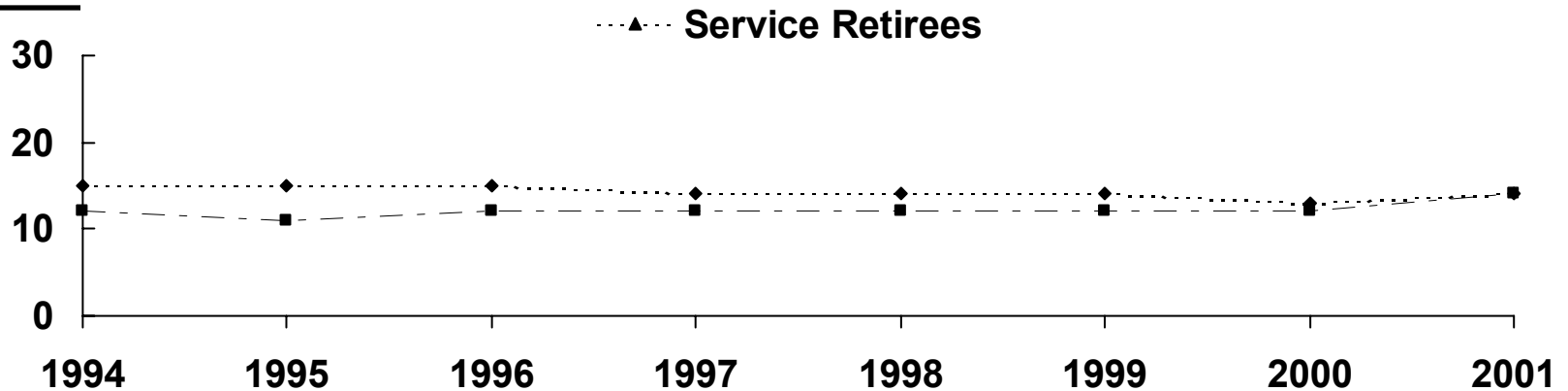
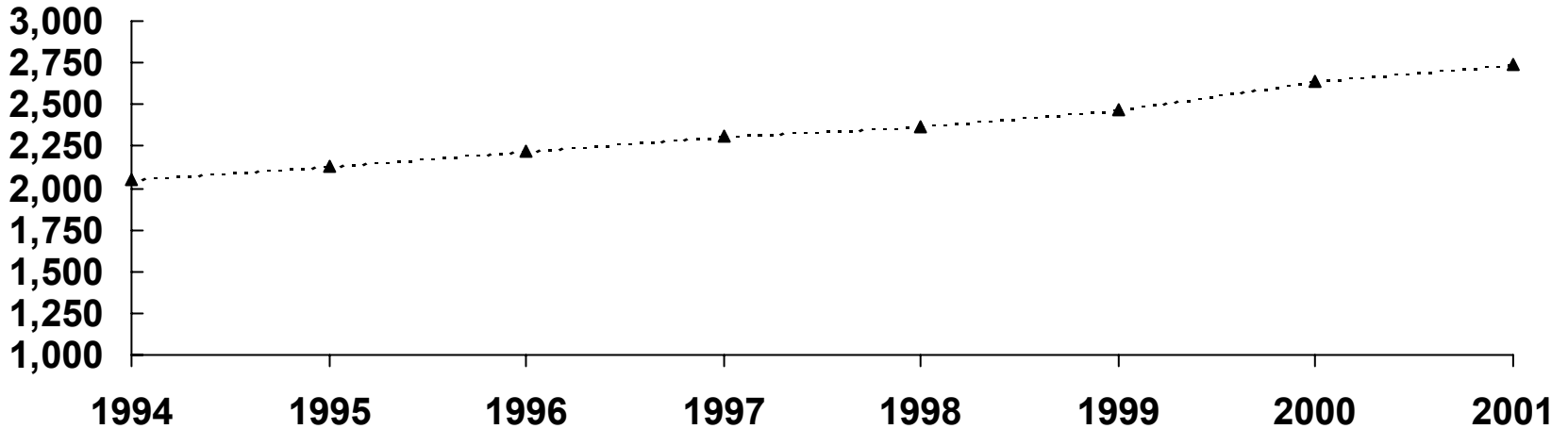
- ✓ The total number of active members covered for a pension benefit decreased from 12,254 to 11,996 (-2.1%).
- ✓ The total number of active members covered for relief benefits increased from 17,607 to 17,794 (+1.1%).
- ✓ The average attained age for members remained the same at 40.9 years.
- ✓ Average service for active members remained the same at 10.1 years.

Retirees:

- ✓ The number of retirees increased from 2,638 to 2,743; an increase of 4.0%.
- ✓ The average monthly benefit payable decreased from \$167 to \$166.

Washington State

Volunteer Firefighters' Relief and Pension Fund Number of People Receiving Benefits at Year End

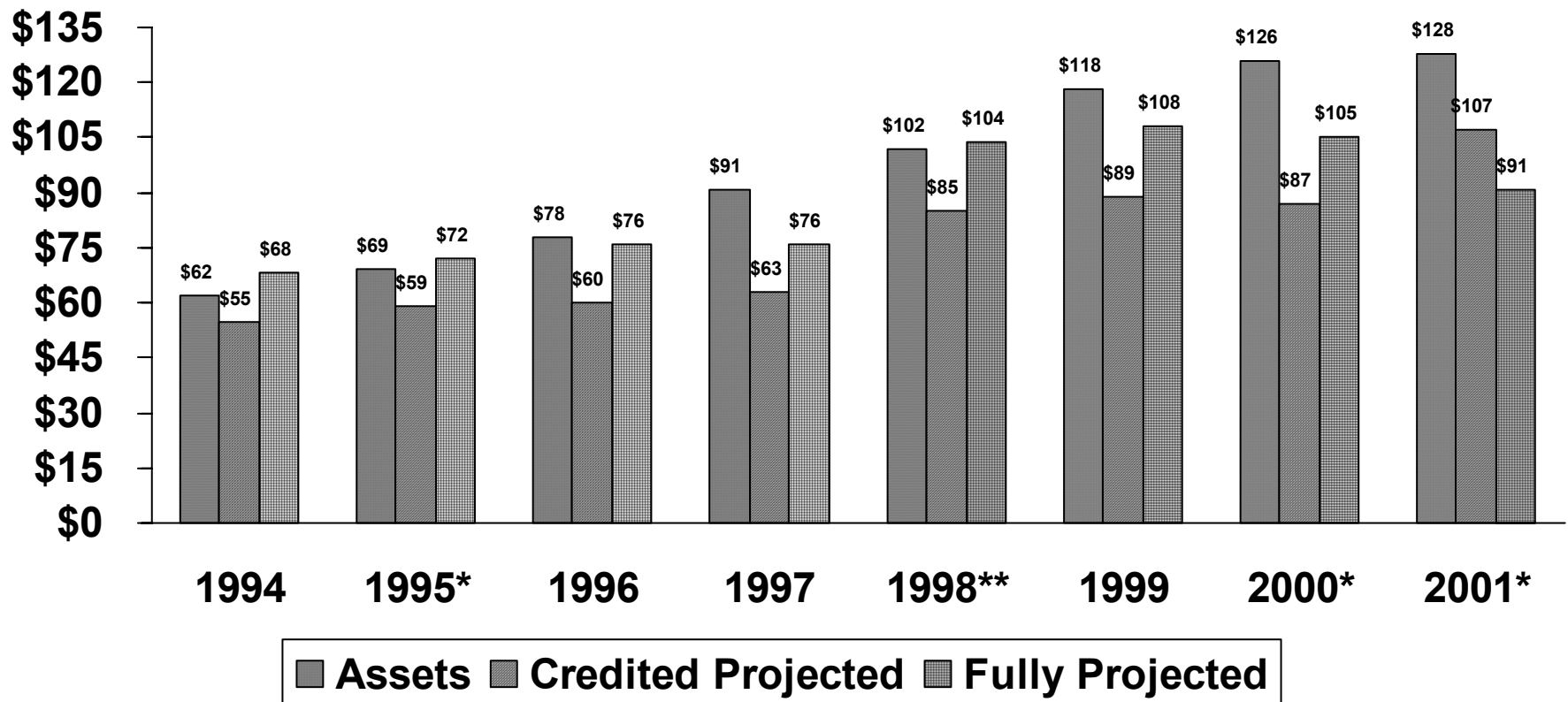


*Relief Benefits

Washington State

Volunteer Firefighters' Relief Pension Fund

Value of Benefits Versus Assets at Year End



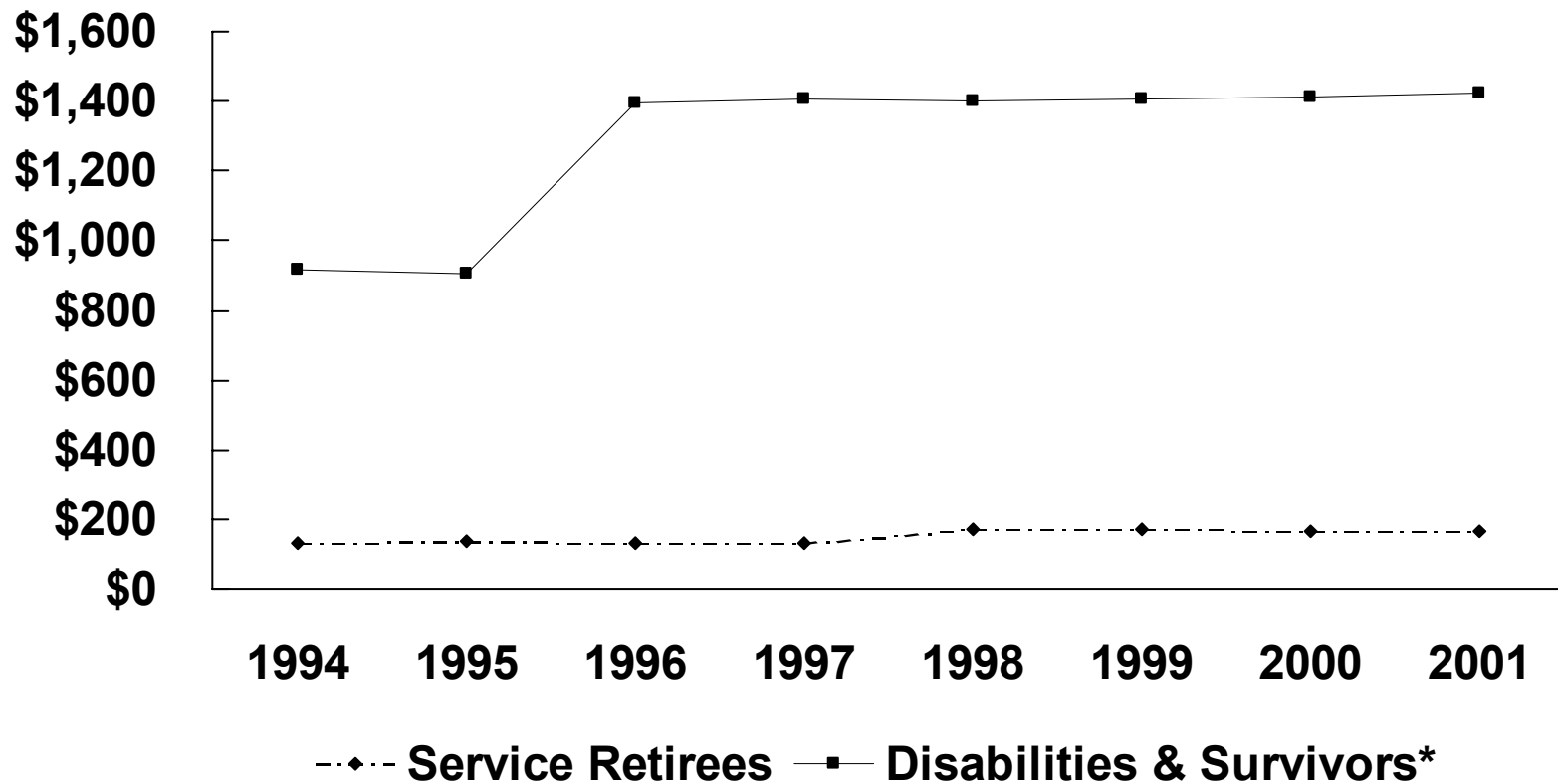
* Actuarial assumptions changed

** Benefits increased

Washington State

Volunteer Firefighters' Relief and Pension Fund

Average Monthly Benefit Payable at Year End

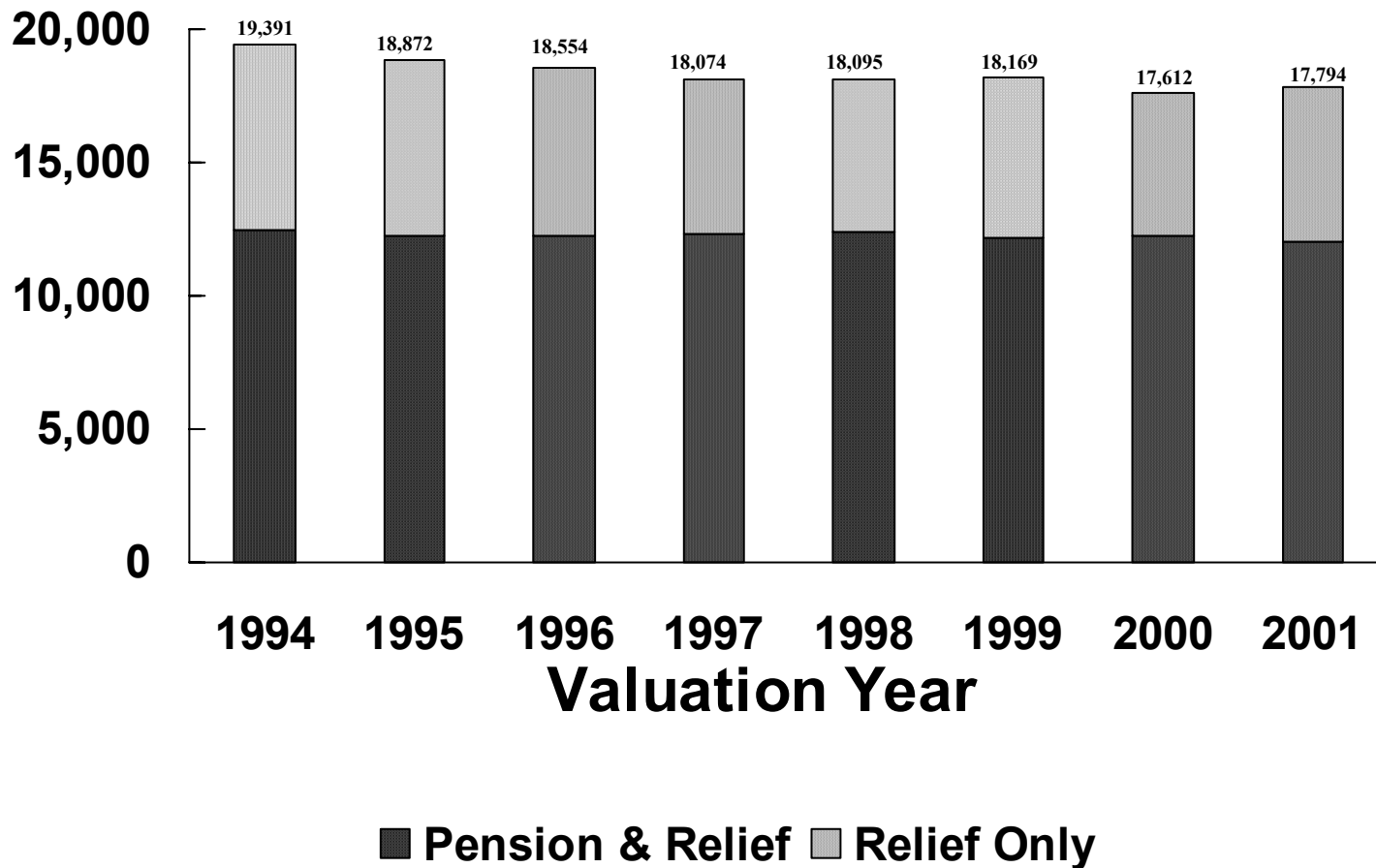


*Relief Plan

Washington State

Volunteer Firefighters' Relief Pension Fund

Number of Active Members at Year End



Section III

Actuarial Determinations

Actuarial Determinations

Table 1
 Volunteer Firefighters' Relief and Pension Fund
Development of Required Annual Contributions Per Member
December 31, 2001

	<u>Per Person</u>	<u>Total (\$,000)</u>
Pension Benefits		
Normal Cost	\$ 118.85	\$ 1,426
Cost to Amortize Unfunded Actuarial Accrued Liability (<i>Surplus</i>)	<u>(255.66)</u>	<u>(3,067)</u>
Total Pension Contribution Rate	\$ (136.81)	\$ (1,641)
Relief Benefits (<i>Disability, Medical, and Survivor Benefits</i>)		
Temporary or Partial Disability	\$ 26.43	\$ 470
Medical Costs	49.17	875
Survivors	<u>14.07</u>	<u>250</u>
Total	\$ 89.68	\$ 1,596
Total Pension and Relief	\$ (47.13)	\$ (45)
Administration	<u>\$ 15.41</u>	<u>\$ 274</u>
Total for Pension, Relief System and Administration*		<u><u>\$ 229</u></u>
*The administration cost of \$274,000 (\$15.41 per person) is based on the actual cost in 2001. If we used the amount allocated to the Administration Fund in 2001 the cost would be \$60,000 (\$3.35 per person).		

Note: Totals may not agree due to rounding.

Pension costs are allocated over 11,996 members; relief costs over 17,794 members; administration costs are allocated over 17,794 members; emergency medical service districts and reserve law enforcement officers pay the full cost, including administration.

Table 2
 Volunteer Firefighters' Relief and Pension Fund
Development of Unfunded Actuarial Accrued Liability
(Dollars in Thousands)
December 31, 2001

a. Actuarial Present Value of Fully Projected Benefits	\$	106,940
b. Valuation Assets	\$	128,799
c. Unfunded Actuarial Present Value of Fully Projected Benefits a-b	\$	(21,859)
d. Actuarial Present Value of Future Normal Costs		
Employer	\$	1,947
Employee	\$	1,947
State	\$	3,564
	\$	7,459
e. Unfunded Actuarial Accrued Liability to be Funded 1/1/2002 - 12/31/2017 (Surplus) c-d	\$	(29,318)
Contribution to Amortize the Unfunded Actuarial Accrued Liability	\$	(3,067)

Note: Totals may not agree due to rounding.

Table 3
Volunteer Firefighters' Relief and Pension Fund
Development of Source of Required Contributions
(Dollars in Thousands)
December 31, 2001

	<u>Total</u>
Actuarial Costs:	
Pension	\$ (1,641)
Relief*	\$ 1,596
Total Actuarial Costs	<u><u>\$ (45)</u></u>
Income:	
Fire Insurance Premium Tax*	\$ 3,320
Administration and Expenses*	\$ (274)
	<u>\$ 3,046</u>
Pension:	
Employer	\$ 360
Employee	\$ 360
Other Pension	\$ 15
	<u>\$ 735</u>
Relief:	
Employer	\$ 178
Other Relief	\$ 20
	<u>\$ 198</u>
Total Income	<u><u>\$ 3,978</u></u>
Surplus (deficit) Income	\$ 4,024

Note: Totals may not agree due to rounding.

* Estimated using actual dollars for 2001.

Other Pension: Emergency Medical Services Districts and Reserve Law Enforcement Officers pay full cost.
Other Relief: Employer pays 1.5% of salary for full paid firefighters not in LEOFF, and Emergency Medical Services Districts pay full cost.

The administration cost of \$274,000 (\$15.41 per person) is based on the actual cost in 2001. If we used the amount allocated to the Administration Fund the cost would be \$60,000 (\$3.35 per person).

Table 4
Volunteer Firefighters' Relief and Pension Fund
Development of Funding Ratio
(Dollars in Millions)
December 31, 2001

	Funding Ratio	
	Valuation Assets	Market Value Assets
Value of Credited Projected Benefits	\$ 91.0	\$ 91.0
Assets	\$ 128.8	\$ 112.5
Unfunded Present Value of Benefits (Surplus)	\$ (37.8)	\$ (21.6)
Funding Ratio:		
December 31, 2001*	142%	124%
December 31, 2000*	144%	139%
December 31, 1999	132%	140%
December 31, 1998**	120%	126%
December 31, 1997	144%	152%
December 31, 1996	129%	136%
December 31, 1995*	118%	125%
December 31, 1994	112%	109%
December 31, 1993*	114%	116%
December 31, 1992	108%	111%
December 31, 1991**	103%	110%
December 31, 1990	111%	114%
December 31, 1989*	112%	114%
December 31, 1988	98%	96%

* Actuarial assumptions changed.

** Benefits were increased.

Table 5
Volunteer Firefighters' Relief and Pension Fund
Actuarial Present Value of Benefits by Benefit Type*
(Dollars in Millions)
December 31, 2001

	<u>Credited Projected</u>	<u>Fully Projected</u>
Active Members		
Retirement	\$ 17.6	\$ 27.1
Vesting	12.8	19.1
Withdrawal	0.1	0.3
Total Actives	<u>\$ 30.5</u>	<u>\$ 46.5</u>
Inactive Members		
Retirees	\$ 40.2	\$ 40.2
Terminated Vested	20.3	20.3
Total Inactives	<u>\$ 60.5</u>	<u>\$ 60.5</u>
2001 Total	<u><u>\$ 91.0</u></u>	<u><u>\$ 106.9</u></u>
2000 Total	<u><u>\$ 87.7</u></u>	<u><u>\$ 105.1</u></u>

Note: Totals may not agree due to rounding.

*Includes pension benefits only, not medical, disability, or survivor benefits.

Section IV

System Assets

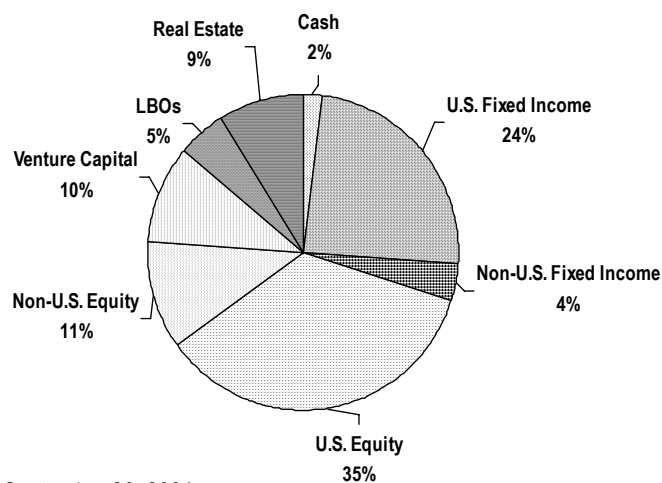
System Assets

Table 6
 Volunteer Firefighters' Relief and Pension Fund
Market Value and Valuation Assets
(Dollars in Thousands)
 December 31, 2001

	<u>Total</u>
Market Assets:	
State Investment Board	\$ 108,193
State Treasury	4,347
Accounts Payable	(7)
Total Invested Assets	\$ 112,532
2001 Unrecognized Investment Gain(Loss) (b)	(11,904)
2000 Unrecognized Investment Gain(Loss) (c)	(4,363)
2001 Valuation Assets (a-b-c)	<u>\$ 128,799</u>
2000 Valuation Assets	<u>\$ 126,332</u>

Note: Totals may not agree due to rounding.

2001 Allocation of Assets*



*As of September 30, 2001.

Table 7
Volunteer Firefighters' Relief and Pension Fund
Summary of Financial Activity
(Dollars in Thousands)
December 31, 2001

Fund Value at Beginning of Year	\$ 122,096
Revenue:	
Contributions:	
Member	\$ 168
Employer	544
<i>Total</i>	<u>\$ 712</u>
Disability Fees	198
Investment Earnings Net of Expenses	(6,610)
Miscellaneous	6
Fire Insurance Premium Tax	3,320
Allocation to the Administration Fund*	(50)
<i>Total Revenue</i>	<u>\$ (2,424)</u>
Disbursements:	
Refunds	16
Expenses	10
<i>Subtotal</i>	<u>\$ 26</u>
Benefits:	
Disability and Survivor	\$ 721
Retirement Pensions (monthly and lump sums)	5,518
Medical	875
<i>Total Benefits</i>	<u>\$ 7,114</u>
<i>Total Disbursements</i>	<u>\$ 7,139</u>
Change in Accounts Payable:	\$ 1
Fund Value at End of Year (Market Value)	\$ 112,532

Note: Totals may not agree due to rounding.

*Actual administration paid from the Administration Fund was \$264,000 for 2001.

Section V

Membership Data

Membership Data

Table 8
Volunteer Firefighters' Relief and Pension Fund
Membership
December 31, 2001

	<u>1994</u>	<u>1995</u>	<u>1996*</u>	<u>1997*</u>	<u>1998*</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Actives								
Members in Relief System	19,391	18,872	18,554	18,074	17,909	18,053	17,607	17,794
Members in Pension System	12,442	12,228	12,279	12,330	12,381	12,210	12,254	11,996
Members in either System					18,095	18,169	17,612	17,794
Percent of Volunteers Covered	64%	65%	66%	68%	68%	67%	70%	67%
Average Age	40.2	40.5	40.5	40.6	40.7	40.8	40.8	40.9
Average Pension Benefit Svc	8.1	8.4	8.5	8.6	8.7	8.8	8.8	8.8
Average Total Service	9.5	9.7	9.9	9.9	10.0	10.1	10.1	10.1
Retirees								
Number of Retirees/Beneficiaries	2,046	2,131	2,222	2,307	2,372	2,473	2,638	2,743
Annual Benefit Payments (,000)	\$ 3,249	\$ 3,384	\$ 3,520	\$ 3,658	\$ 4,811	\$ 4,999	\$ 5,277	\$ 5,448
Average Annual Benefit	\$ 1,588	\$ 1,588	\$ 1,584	\$ 1,586	\$ 2,029	\$ 2,021	\$ 2,000	\$ 1,986
Average Age	71.5	71.8	72.0	72.2	72.5	72.6	72.7	72.8
New Retirees	147	145	154	149	137	186	227	193
Term Vested								
Number of Term Vested	2,574	2,763	2,973	3,203	3,398	3,751	3,960	4,210
Survivor & Disabled								
Number of Survivors	15	15	15	14	14	14	13	14
Member of Disabled	12	11	12	12	12	12	12	14
Average Annual Benefit	\$ 10,973	\$ 10,855	\$ 16,711	\$ 16,843	\$ 16,793	\$ 16,884	\$ 16,947	\$ 17,086

*1996, 1997 and 1998 data have been revised using straight-line interpretation techniques for missing data.

Table 9
Volunteer Firefighters' Relief and Pension Fund
Active Members
Distribution by Age and Membership Service
December 31, 2001

Nearest Year of Membership Service:	Age Group (Nearest Birthday)									Total
	Less than 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60& Over	
1	420	176	184	111	93	75	40	32	23	1,154
2	405	231	158	143	119	80	48	42	27	1,253
3-4	419	349	320	256	274	148	114	62	43	1,985
5-9	132	415	472	442	459	350	197	109	80	2,656
10-14	0	45	210	277	358	381	267	155	94	1,787
15-19	0	0	22	161	279	314	251	154	125	1,306
20-24	0	0	0	19	166	232	260	195	126	998
25 +	0	0	0	0	20	123	221	253	240	857
Total	1,376	1,216	1,366	1,409	1,768	1,703	1,398	1,002	758	11,996

Table 10
Volunteer Firefighters' Relief and Pension Fund
Active Members
Distribution by Age and Benefit Service
December 31, 2001

Nearest Year of Benefit Service:	Age Group (<i>Nearest Birthday</i>)									Total
	Less than 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60& Over	
1	543	269	239	158	134	104	64	50	37	1,598
2	419	223	171	152	131	83	51	46	40	1,316
3-4	300	293	292	235	250	159	106	60	43	1,738
5-9	114	397	462	440	481	363	249	138	97	2,741
10-14	0	34	186	283	372	416	286	186	122	1,885
15-19	0	0	16	131	265	318	279	165	143	1,317
20-24	0	0	0	10	127	183	202	197	134	853
25 +	0	0	0	0	8	77	161	160	142	548
Total	1,376	1,216	1,366	1,409	1,768	1,703	1,398	1,002	758	11,996

Table 11
Volunteer Firefighters' Relief and Pension Fund
Service Retirees*
December 31, 2001

Age	Number of Retirees	Average Annual Benefit
60	33	1,016
61	25	1,448
62	43	1,551
63	79	1,765
64	107	1,843
65	123	1,886
66	140	1,880
67	156	1,942
68	142	2,030
69	137	2,095
70	139	1,938
71	151	2,028
72	150	2,079
73	129	2,061
74	156	2,060
75	134	2,142
76	138	2,023
77	125	2,051
78	90	2,104
79	73	2,071
80	98	1,996
81	76	2,112
82	68	1,900
83	31	2,144
84	36	2,136
85	33	1,954
86	34	2,216
87	26	2,026
88	18	1,990
89	10	1,787
90 +	43	2,069
Total	2,743	1,986

**Includes beneficiaries of service retirees. Does not include beneficiaries of the Relief System.*

Table 12
Volunteer Firefighters' Relief and Pension Fund
Disabilities and Survivors
December 31, 2001

Disabilities		
Age	Number of Lives	Average Annual Benefit
46	1	18,360
48	1	18,360
49	2	17,843
53	1	18,360
62	1	19,065
64	1	15,300
65	1	18,360
66	1	20,914
67	3	19,072
74	1	18,360
76	1	18,360
Total	14	\$ 18,453

Survivors		
Age	Number of Lives	Average Annual Benefit
26	1	15,888
44	2	17,940
64	1	15,300
65	2	15,300
77	1	15,300
78	1	15,300
80	1	15,300
82	1	15,300
84	2	15,300
87	1	15,300
90	1	15,300
Total	14	\$ 15,719

Appendix A

Actuarial Assumptions

Actuarial Assumptions

Administrative Expenses:

The administrative expenses of the system are deducted from the fire insurance premium tax.

In determining this years contribution rates, we included the administrative expenses at last years actual value.

Valuation of Assets:

Investment gains (losses) are investment return in excess of (below) the assumed rate. New gains (losses) are recognized at 25% per year over a four year period. However, the 1998 and 1999 valuation gains were still recognized over three years at the rate of 50%, 30% and 20%.

Mortality:

Mortality rates are from the RP 2000 Combined Healthy Mortality Table.

Termination:

Termination is a function of membership service. It starts at 17% and grades down to 4% just prior to 25 years. There is a bump at 20 years (when the service retirement factor significantly improves from 35% to 75%) and at 25 years (when maximum benefit levels can first be reached).

Investment Returns:

We have assumed an investment return of 8.0%.

Retirement Rates:

The actuarial reduction for early retirement is not a smooth function but instead has a big jump at ages 60, 62, and 65. Retirement rates from active or term vested status reflect these discontinuities.

Table 13
Volunteer Firefighters' Relief and Pension Fund
Termination Rates
December 31, 2001

Probability of Termination			
Years of Service	Rate	Years of Service	Rate
1	17%	15	6%
2	17%	16	5%
3	16%	17	5%
4	15%	18	4%
5	14%	19	4%
6	12%	20	9%
7	11%	21	4%
8	9%	22	4%
9	9%	23	4%
10	9%	24	4%
11	8%	25	19%
12	8%	26	13%
13	6%	27 +	8%
14	6%		

Table 14
Volunteer Firefighters' Relief and Pension Fund
Retirement Rates
December 31, 2001

Probability of Retirement			
Active Service		Terminated Vested Status	
Age	Rate	Age	Rate
- 59	0%	- 61	0%
60	6%	62	100%
61	3%	63	0%
62	17%	64	0%
63	9%	65 +	100%
64	3%		
65	46%		
66 +	26%		

Table 15
Volunteer Firefighters' Relief and Pension Fund
Probabilities of Death
December 31, 2001

Age	Contributing Members and Members Retired from Service
20	0.0345%
25	0.0376%
30	0.0444%
35	0.0773%
40	0.1079%
45	0.1508%
50	0.2138%
55	0.3624%
60	0.6747%
65	1.2737%
70	2.2206%
75	3.7834%
80	6.4368%
85	11.0757%
90	18.3408%
95	26.7491%

Appendix B

Description of Actuarial Cost Method

Description of Actuarial Cost Method

Every actuarial cost method is defined by the manner of development of two items:

- ✓ Normal Cost
- ✓ Unfunded Actuarial Accrued Liability

The contribution rate is developed as the sum of the Normal Cost and an amount to amortize the Unfunded Actuarial Accrued Liability.

The actuarial cost method utilized in the valuation to develop contribution rates for Volunteer Firefighters' is a version of the Entry Age Cost Method. Under this method, the Normal Cost of each type of benefit in the pension system is determined as that contribution rate which, if paid from entry date to retirement date on behalf of the average member of the system, would fully support that benefit for such member.

The Unfunded Actuarial Accrued Liability is the excess of:

- ✓ The Actuarial Present Value of Fully Projected Benefits (the discounted current value of all benefits estimated to be paid in the future under the retirement system) over
- ✓ The sum of (a) the Actuarial Present Value of Future Normal Costs under the System, and (b) the value of assets currently in the fund.

Such an excess can arise for numerous reasons. While insufficient contributions and unrealistic actuarial assumptions can contribute, the major reason for its development is simply the natural growth of a retirement system. Examples of conditions which give rise to Unfunded Actuarial Accrued Liabilities are:

- ✓ Benefits granted for service prior to establishment of the plan;
- ✓ Retroactive benefit increases or plan liberalizations;
- ✓ Change of actuarial assumptions; and
- ✓ Actual experience under the System significantly at variance with the actuarial assumptions.

The contributions toward the Unfunded Actuarial Accrued Liability have been developed in this valuation as level dollar amounts which will amortize this item by December 31, 2017.

Relief costs are included on a pay-as-you-go basis. Last year's actual costs are used to determine this year's contribution rates.

Appendix C

Summary of the Provisions of the System

Summary of the Provisions of the System

There are two employee benefits provided to volunteer fire fighters: optional membership in the retirement plan and mandatory death and disability coverage for duty-related injuries. These benefits are part of two distinct plans, authorized by different sections of statute, and should not be confused as one.

The following section summarizes the benefits and contributions established under Chapter 41.24 RCW. This section is meant for purposes of reference, and does not detail the rules and regulations upon which the actuarial calculations are made.

Participation:

RCW 41.24.010 (10):

“Participant” means: (a) For purposes of relief, any reserve officer who is or may become eligible for relief under this chapter or any fire fighter or emergency worker; and (b) for purposes of retirement pension, any fire fighter, emergency worker, or reserve officer who is or may become eligible to receive a benefit of any type under the retirement provisions of this chapter, or whose beneficiary may be eligible to receive any such benefit.

Contributions:

- ✓ *Death and Disability* - The member does not contribute. Municipalities contribute \$10.00 annually on behalf of each member. Also, municipalities contribute 1.5% of the annual salary of full paid firefighters not covered under LEOFF.
- ✓ *Retirement* - If a member chooses to enroll, they contribute \$30.00 annually and the municipality pays \$30.00. Also, 40% of all premium taxes on fire insurance policies are paid into the plan.

Refund of Contributions:

Upon termination, members are entitled to a refund of their contributions without interest. If the member chooses this option, he/she then forfeits any earned pension benefits.

Buying Back Past Service:

If the pension payment is missed in any year following enrollment in the plan, it may be paid at a later date. Interest is levied at a rate of 1% per month.

Medical Benefits (*Relief Plan*):

Physician and hospitalization costs are covered to the extent set out in the RCW's.

Disability Payments (*Relief Plan*):

- ✓ *Duty Disability* - Members receive payments of \$2,550 per month for up to 6 months, thereafter payments are reduced. Disabled members receive \$1,275 per month, their spouse \$255, and dependant children \$110.
- ✓ Effective July 1, 2001 benefits are increased annually in line with the CPI Urban Wage Earners and Clerical Workers, all items, all cities index.
- ✓ *Non-Duty Disability* - None.

Death Benefits (*Relief Plan*):

- ✓ *Survivors* - Surviving spouses of active duty deaths shall be paid \$1,275 monthly. An additional \$110 is paid monthly to member's children while they are under 18 years old. The survivor benefits are subject to a maximum of \$2,550 monthly.
- ✓ Effective July 1, 2001 the maximum of \$2,550 is increased annually in line with the CPI Urban Wage Earners and Clerical Workers, all items, all cities index.

Death Benefits:

- ✓ *Duty Death* - A lump sum of \$152,000 is made.
- ✓ *Funeral and Burial Expenses* - A lump sum of \$2,000 is paid for active duty deaths. Members receiving disability benefits at the time of death shall be paid \$500.
- ✓ *Non-duty* - Refund of contributions. In lieu of refund of contributions an eligible spouse may elect an annuity. The annuity is the member's accrued benefit actuarially adjusted to reflect 100% Joint and Survivor pop-up pension and further actuarially reduced to reflect the difference in the number of years between the fire fighter's age at death and age 65.

Retirement Pensions:

At age 65 and 10 years of Service, the pension is unreduced for age. Early retirement eligibility begins at age 60 with 10 years of Service, with a reduction for age. In either case the pension is reduced for Service less than 25 years.

The monthly pension benefit formula is:

$(\$30 + \$10 \times \text{Benefit Service}) \times (\text{Service Factor}) \times (\text{Age Factor})$.

"Benefit Service" is the number of years the member has made pension contributions.

"Service" is the number of years the member has been a member of the Relief Plan.

The maximum monthly pension benefit is \$280.

Service Factor for Less than 25 Years of Service:

Service	10 to 14	15 to 19	20 to 24	25 or more
Service Factor	20%	35%	75%	100%

Age Factor for Retirement Before Age 65:

Age	60	61	62	63	64	65
Age Factor	60%	68%	76%	84%	92%	100%

Retirement Options:

The normal form of benefit is a Single Life pension.

Retirees have the option of selecting a 100% Joint and Survivor Pop-up pension instead. If the member dies first, the pension continues to the spouse, unreduced. If the spouse dies first, the pension pops up to the amount the member would have received under the normal form.

Benefit Improvements:

None.

Appendix D

Glossary of Terms

Glossary of Terms

Actuarial Accrued Liability:

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by Future Normal Costs. The Actuarial Accrued Liability is determined by the Actuarial Cost Method used.

Actuarial Assumptions:

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; characteristics of future entrants and other relative items.

Actuarial Cost Method or Funding Method:

A plan for determining the liabilities of a pension system and determining future contributions that will satisfy all the liabilities. The method determines what portion of the cost and consequently what contribution rate shall be assigned to each time period (Normal Cost). It also determines the Actuarial Accrued Liability.

Actuarial Present Value:

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation:

The determination as of a valuation date of the assets and liabilities of a pension system. This involves calculating the Normal Cost, Actuarial Accrued Liability, Valuation Assets and related Actuarial Values as determined by the Actuarial Cost Method and assumptions. The results are used to determine future contributions and funding status.

Credited Projected Benefits:

Benefits are projected to retirement including future service but prorated by only that service credit earned to date.

Entry Age Actuarial Cost Method:

A method by which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed retirement age. That portion of the Actuarial Present Value allocated to a year is called the Normal Cost. That portion of the Actuarial Present Value not provided for at a valuation date by the future Normal Costs is called the Actuarial Accrued Liability.

Funding Ratio:

The ratio of assets to the Actuarial Present Value of benefits; i.e., the percentage of benefits earned to date which are covered by current assets. The ratio is often used as a measurement of funding progress. Benefits may be calculated by either the Accrued Benefit or Credited Projected Benefit method. Assets may be either Valuation Assets or Market Assets.

Market Value of Assets:

The market value of cash, bonds, and mortgages. This is the amount that could be obtained by liquidating the portfolio on the valuation date.

Normal Cost:

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to the valuation year by the Actuarial Cost Method.

Projected Benefits:

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, and past and anticipated future compensation and service credits.

Unfunded Actuarial Accrued Liability:

The excess, if any, of the Actuarial Accrued Liability over the Valuation Assets. This value is usually amortized over a fixed period.

Valuation Assets:

Market values are adjusted over a four year period (please see Appendix A, Valuation of Assets). This is an effort to dampen the effects of volatility and to reflect the "long term" value of assets as opposed to the particular amount on the valuation date.

Appendix E

Emergency Medical Service Districts
and
Reserve Law Enforcement Officers

Emergency Medical Service Districts and Reserve Law Enforcement Officers

Emergency Medical Service Districts:

Chapter 331, Laws of 1993 extended the membership provisions of the pension and relief plans to include Emergency Medical Service District (EMSD) Volunteers.

RCW law states that the funding of the EMSD volunteers should be consistent with the most recent actuarial valuation.

The funding of the system includes contributions from the members and their districts at a rate established in statute. The total of these is less than the normal cost. The balance of the normal cost comes from another revenue source, 40% of the state's premium tax on fire insurance policies. Since the premium tax is independent of the number of members, the addition of new members lowers the system's funding. To prevent this, the entire normal cost and administration expenses shall be paid by the EMSDs and their volunteers. Volunteers pay the fixed dollar rate established in statute. The EMSDs pay the fixed dollar rate plus any excess cost.

Reserve Law Enforcement Officers:

Chapter 11, Laws of 1995 extended the membership provisions of the pension plan to include Reserve Law Enforcement Officers. The pension provisions mirrored those of the EMSD's.

Chapter 148, Laws of 1999 extended the membership provisions of the relief plan to include Reserve Law Enforcement Officers. The relief provisions mirrored those of the EMSD's.